We claim:

1. An apparatus for generating high intensity X-rays comprising:
a source for generating a focused beam of electrons; and
at least one X-ray anode in the form of the interior surface of a metallic tube.

2. The apparatus of claim 1, wherein the at least one X-ray anode comprises a plurality of X-ray anodes.

3. The apparatus of claim 1, wherein the at least one X-ray anode comprises at least one first X-ray anode and at least one second X-ray anode, the metallic tube of the first X-ray anode comprising a first material, and the metallic tube of the second X-ray anode comprising a second material, the second material being different from the first material.

4. The apparatus of claim 3, further comprising an electron beam deflector adapted to selectively deflect the focused beam of electrons to one of the first X-ray anode and the second X-ray anode.

5. The apparatus of claim 4, wherein the at least one first X-ray anode comprises a plurality of first X-ray anodes and the at least one second X-ray anode comprises a plurality of second X-ray anodes.

6. The apparatus as in claim 5, wherein the electron beam deflector is adapted to deflect the electron beam to (i) one of the plurality of first X-ray anodes and the plurality of second X-ray anodes exclusively and (ii) at least one first X-ray anode and at least one second X-ray anode simultaneously.

7. The apparatus as in claim 1, further comprising a variable voltage power supply for powering the source.

8. The apparatus of claim 1, wherein the metallic tube comprises one of Tungsten and Molybdenum.

9. The apparatus of claim 1, wherein a heat-conducting layer overlies the metallic tube.

10. The apparatus of claim 9, wherein the heat-conducting layer comprises one of gold, silver and copper.

11. The apparatus of claim 1 wherein an X-ray radiation-absorbing layer overlies the metallic tube.

12. The apparatus of claim 11, wherein the X-ray radiation-absorbing layer comprises Beryllium.

13. The apparatus of claim 1, wherein an end of the metallic tube through which the X-rays exit is sealed by a thin layer of metallic material of essentially the same composition as the material comprising the metallic tube.

14. A guide tube anode assembly for use in an X-ray generation device, the guide tube anode assembly comprising:

a metallic interior tubular layer having a thickness of between 10-1000 atomic layers; and

an X-ray radiation absorbing tubular layer at least partially overlying the metallic interior tubular layer.

15. The guide tube anode assembly of claim 14, further comprising a heat conducting tubular layer contained between the metallic interior tubular layer and the X-ray radiation absorbing tubular layer.

16. The guide tube anode assembly of claim 14, wherein the metallic interior tubular layer has a thickness of between about 10-18 atomic layers.

17. The guide tube anode assembly of claim 14, further comprising a thin metal layer covering at least one end of the guide tube anode assembly, the thin metal layer comprising essentially the same material as the metallic interior tubular layer.

18. A method of generating a highly directional beam of X-ray radiation, the method comprising:

directing a high energy electron beam from an electron beam generator into first ends of one or more tubular anodes, each tubular anode comprising a cylindrical metal tube having a thin wall thickness;

creating X-ray radiation as a result of grazing collisions with the interior surface of each metal tube of the one or more tubular anodes;

directing a beam of X-ray radiation having essentially a characteristic line spectrum related to a specific metal utilized in the metal tubes of the one or more tubular anodes down the metal tubes and out of second ends of the tubular anodes.

19. The method of claim 18, wherein the one or more tubular anodes comprises a plurality of tubular anodes, further comprising deflecting the high-energy electron beam into a fractional portion of the plurality of tubular anodes.

20. The method of claim 19, wherein the plurality of tubular anodes comprises at least first and second arrays of tubular anodes, the first array including only metal tubes comprising a first metal, and the second array including only metal tubes of a second metal , the first and second metals being different from each other, further comprising selectively deflecting the high energy electron beam between the first and second arrays.